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CENTRAL INTELLIGENCE AGENCY

ARMY

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three-page report concerning a Soviet-manufactured radio receiver used by the Yugoslav Army

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ATTACHMENT [redacted] ATTACHME [redacted] 25X1

During September 1956 the Yugoslavs received, from the Soviets about one hundred military radio receivers intended for stationary or mobile employment by tl the ground forces. The receivers [redacted]. Their 25X1 characteristics and use resemble those of the US model BC 312/342.

The range of the receiver is from 1.5 to 21 megacycles in six bands and it is equipped with Soviet tybes. It differs from the US type inasmuch as it may be fed with a 12-volt current, either alternating or direct, with a rotating converter and can therefore by used as a stationary or mobile set.

The receiver is equipped with a device which varies the width of the band in steps of 0.5 to 3.5 kilocycles continuously; the device, although of the piezoelectric crystal variety, is much more flexible than those with mormal crystal filters so that it can be used by untrained operators, appreciably increasing communications sureness when the signal is difficult to hear because of interference.

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The filter [redacted] has the virtue of preventing the signal from drifting or detuning; further, the two standard selectivity and phasing controls are inexistent (as in the Super Pro, or SX 28, or AR 88); there is only one control, that is, width of the individual band.

The device is drawn in the attached sketch and has two identical filters in stages, tuned on 470 kilocycles and furnished with two quartzes, Q1 and Q2. Note that each filter, in addition to its Q crystal, has two resonant circuits, one input and one putput. The two resonant circuits in each filter are tuned by a small-capacity variable condenser having rotors which are offset 180 degrees, so that while the capacity of one condenser increases, that of the other decreases. Thus, acting on the variable, the input of the first filter is tuned toward minor frequencies and the output circuit is detuned toward major frequencies, and similarly for the circuits of the second filter.

In this manner the response curve of the filter appears symmetrical on its sides and the response inside the individual band is more uniform. Obviously, with narrow band conditions the resonant circuits are detuned--as we saw in a symmetrical way--with respect to the frequency of the crystal. With wide band conditions, the circuits are tuned on the crystal frequency, with consequent increase of the series impedance and decrease of selectivity.

The multiple effect of the response of the staged filters, and the staggered adjustment of the various resonant circuits give the response inside the individual band a flat top shape, contrary to what happens in normal crystal filters, even under conditions of minimum selectivity. The parallel capacitance of the crystals is exactly neutralized by trimmers CN_1 and CN_2, which contributes to the maximum steepness of response on one of its sides, the steepness on the other side being less but always great.

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Measurements taken demonstrate that under wide band conditions (3.5 kilocycles at 3 decibels) the response falls [redacted] 60 decibels at one kilocycle from the end of the band, whereas under narrow band conditions [redacted] (that is, 500 cycles at 3 decibels) the width is 2 kilocycles at 40 decibels.

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